

# INTENSIVE VERSUS STANDARD LOWERING OF BLOOD PRESSURE IN THE ACUTE PHASE OF INTRACRANIAL HAEMORRHAGE

**Intensive versus standard lowering of blood pressure in the acute phase of intracranial haemorrhage: a systematic review and meta-analysis.**

**Adriana Cordier**

**Study Question:** Is intensive BP lowering (systolic BP goal < 140mmHg) better compared to standard BP lowering (systolic BP goal < 180mmHg) in the acute phase management of Intracranial Haemorrhage (ICH)?

**How does this relate to our practice on NCCU?**

Spontaneous ICH is a common presentation seen on NCCU. We generally aim to achieve a systolic range of 140 – 160mmHg, however target values for the systolic BP sometimes varies depending on clinician and patient.

**What do we currently know about this field?**

Blood Pressure targets for the acute phase management of ICH are controversial. Traditionally the BP was only treated once it exceeded 180mmHg systolic with a target reduction of 160/90 mmHg.

The INTERACT II trial published in 2013, looked at intensive BP lowering to < 140mmHg compared to standard BP lowering to < 180mmHg. No difference in death or major disability were found, but better functional outcomes were reported in the intensive treatment group. The ATACH II trial published in 2016 also looked at intensive vs standard BP management in acute phase management of ICH and found no difference in death, disability or haematoma size between the two treatment groups, they did however report an increase incidence of adverse renal events (9% vs 4%, p=0.002) in the intensive treatment group.

Based on the results of the INTERACT II trial, current guidelines (2015), recommend that the systolic BP should be lowered to < 140mmHg in patients presenting with spontaneous ICH and systolic BP between 150mmHg – 200mmHg, provided there are no contra-indications. The optimum BP target in patients presenting with systolic BP > 220mmHg is less clear, but it is still felt that aggressive BP lowering is reasonable.

### **Why is this meta-analysis needed?**

The controversy in the treatment of the acute phase BP lies between decreasing the BP enough to prevent exacerbation of the bleed whilst still maintaining sufficient cerebral blood flow to prevent secondary ischaemic injury in patients who may be chronically hypertensive.

Stroke is currently the leading cause of disability in the UK. ICH is the most common cause of stroke in young adults and the second most common cause of stroke in general.

It is therefore important to try and identify the treatment that is associated with the best outcome.

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### **Background reading**

Wikijournal gives a quick summary of the INTERACT II and ATACH II ([https://www.wikijournalclub.org/wiki/ATACH\\_II](https://www.wikijournalclub.org/wiki/ATACH_II)) trials which are by far the 2 largest studies included in this meta-analysis.

The Bottom Line also gives a good review of the ATTACH II trial.

Reviews on the CHIPPS trial and other issues in this field: Medscape, LITFL, EMCrit, Journal of Vascular and Interventional Neurology, and EMJClub.

### **Points for consideration**

Population: In both the INTERACT II and the ATTACH II trials, the majority of the study population were Asian, which may not reflect our local population.

Onset as well as period of treatment varied significantly between different studies.

Better functional outcomes were reported in the intensive treatment group during the INTERACT II trial, but this was a secondary outcome measure for which the study was not powered. Also, the improvement in functional outcome seen was based on an ordinal analysis of the modified Rankin scale scores, without which it would not have been statistically significant. Furthermore, this analysis was considered only after the trial had commenced.

Meta-analysis may be at risk of publication bias. (No funnel plot included)

They used risk ratios as outcome measure, which may have been influenced by varying baseline event rates in the different studies used in this meta-analysis.

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### **Should we change practice on NCCU?**

I don't think so. At present we usually aim to lower the systolic BP in the acute phase to below 160mmHg, but tend to decide the target systolic based on individual presentation. Looking at the evidence, there is certainly no convincing proof that aggressively lowering blood pressure offers any benefit to patients compared to standard reduction in BP. I think we should be mindful that the increase in BP after an intracranial event may be a protective mechanism and that some patients may be used to a having a much higher average BP, so by lowering the BP to aggressively in the acute phase, we may actually be causing the exact opposite from what we are trying to achieve.

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### **Further reading**

Current NICE guidelines are based on the AHA/ASA Guidelines for the management of Spontaneous Intra-cerebral Haemorrhage

Review on the current management of spontaneous intra-cerebral haemorrhage.

Approaches to appraising a meta-analysis [here](#) and [here](#).

UK Stroke Statistics